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SWEET GRASS COUNTY

RURAL AND WILDLAND FIRE PROTECTION PLAN

Forestry Division

Department of Natural Resources and Conservation

1978

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"During an average year, 120,000 wildland fires burn three million acres in the United States. The resource value destroyed is about $200 million, and the loss in terms of national products approached one billion dollars." (USDA 1978)

Photo 1: Sweet Grass County Landscape

Sweet Grass County, through this document, is requesting to enter into a cooperative agreement with the State of Montana to better meet Sweet Grass County's fire protection responsibilities.

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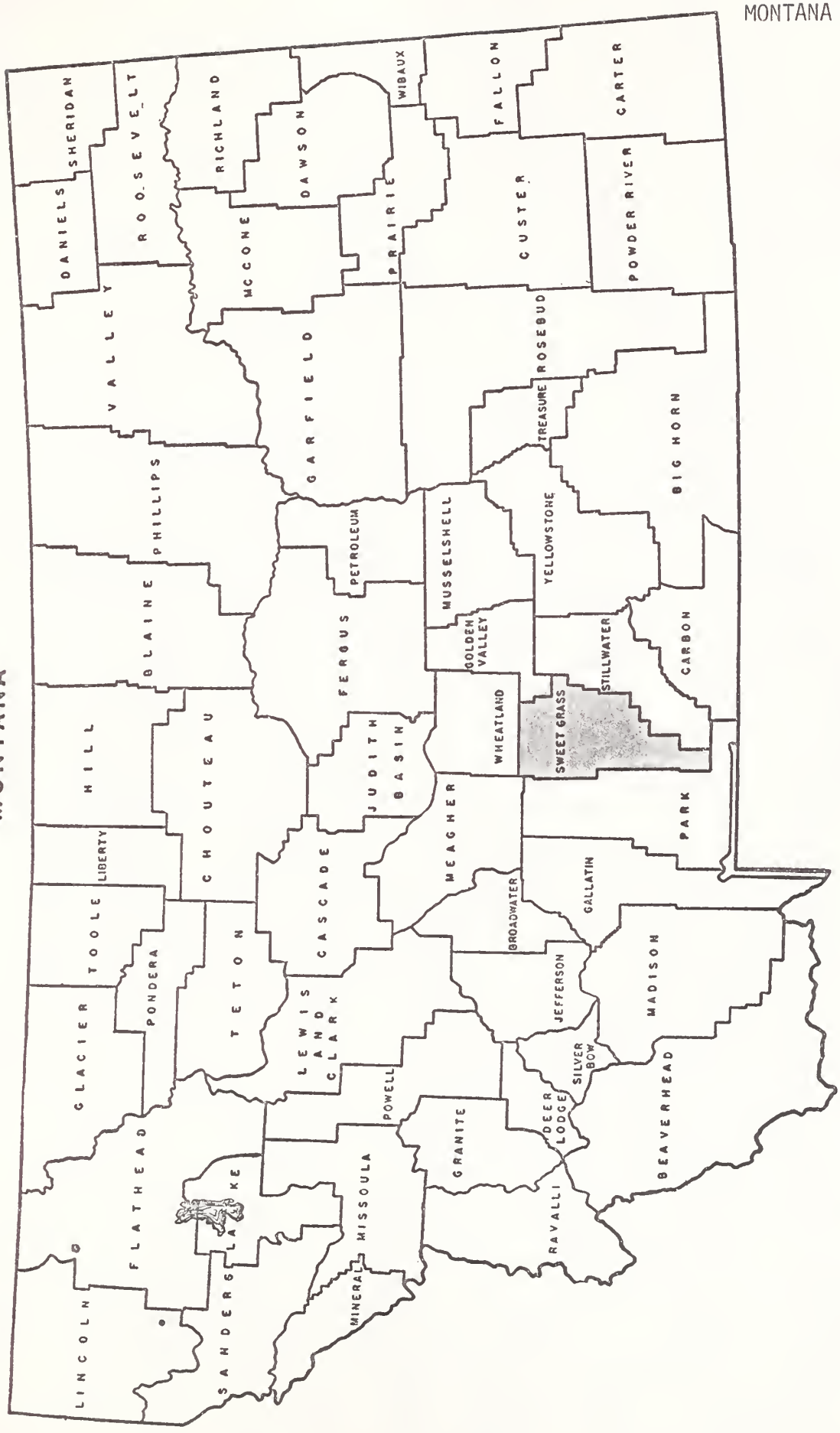
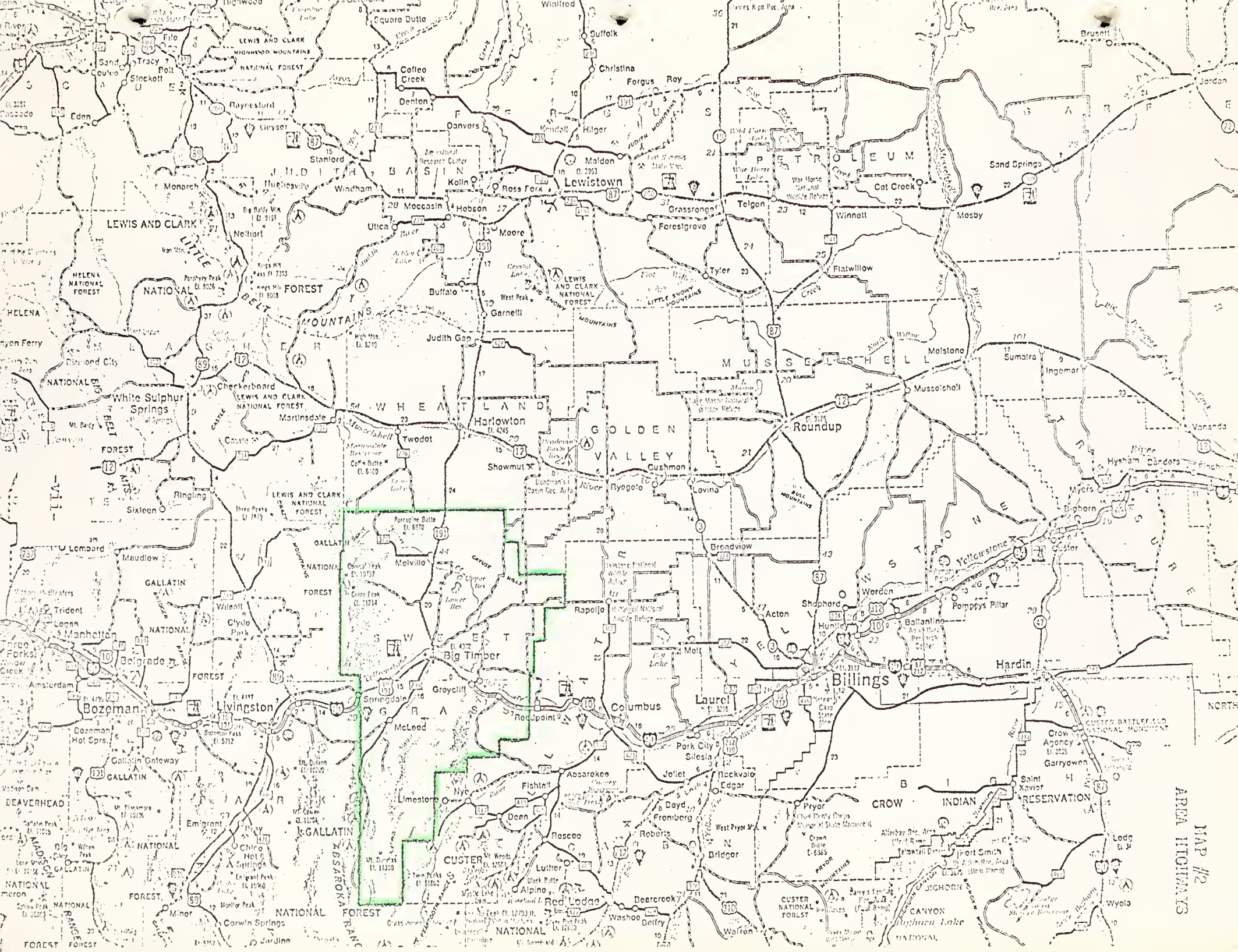
MAP #1
MONTANA COUNTIES




MAP #2
AREA HIGHWAYS
Billings
Bozeman
Livingston
Big Timber
Hardin
Columbus
Laurel
Lewistown
Roundup
Harlowton
White Sulphur Springs
Helena
Boulder
Townsend
Three Forks
Manhattan
Belgrade
Amsterdam
Sheridan
Ennis
Virginia City
Dillon
Wisdom
Wise River
Jackson
Wisdom
Melrose
Whitehall
Butte
Anaconda
Deer Lodge
Philipsburg
Drummond
Hall
Garrison
Avon
Ovando
Seeley Lake
Missoula
Lolo
Hamilton
Darby
Sula
Conner
Salmon
Leadore
Gibbonville
Dubois
Lemhi
Mackay
Arco
Howe
Atomic City
Idaho Falls
Rigby
Ashton
Island Park
Yellowstone National Park
Grand Teton National Park
Jackson Hole
Moran
Dubois
Lander
Riverton
Shoshoni
Thermopolis
Worland
Basin
Greybull
Lovell
Cowley
Powell
Cody
Meeteetse
Ten Sleep
Buffalo
Kaycee
Mayoworth
Sheridan
Dayton
Ranchester
Big Horn
Story
Parkman
Banner
Clearmont
Arvada
Gillette
Wright
Moorcroft
Sundance
Hulett
Aladdin
Alva
Beulah
Hulett
Newcastle
Upton
Osage
Sundance
Spearfish
Deadwood
Lead
Belle Fourche
Sturgis
Rapid City
Hot Springs
Edgemont
Oelrichs
Chadron
Crawford
Harrison
Hemingford
Alliance
Scottsbluff
Gering
Bridgeport
Kimball
Sidney
Lodge Grass
Wyola
Garryowen
Crow Agency
Saint Xavier
Pryor
Fort Smith
Bighorn Lake
Custer Battlefield National Monument
Custer National Forest
Crow Indian Reservation
Bighorn Canyon National Recreation Area
Pompeys Pillar
Worden
Shepherd
Huntley
Ballantine
Acton
Molt
Rapelje
Broadview
Melville
Livingston
Springdale
Groycliff
Roscoe
Luther
Alpine
Red Lodge
Bearcreek
Washoo
Joliet
Rockvale
Edgar
Park City
Silesia
Absarokee
Fishtail
Nye
Limestone
Dean
Boyd
Fromberg
Roberts
Bridger
Pryor
Custer
Gallatin
Beaverhead
Madison
Big Hole
Ruby Range
Tobacco Root Mountains
Gallatin Range
Absaroka Range
Bridger Mountains
Crazy Mountains
Big Snowy Mountains
Little Snowy Mountains
Judith Mountains
Bull Mountains
Little Belt Mountains
Castle Mountains
Elkhorn Mountains
Boulder Mountains
Highwood Mountains
Big Belt Mountains
Lewis and Clark National Forest
Helena National Forest
Gallatin National Forest
Beaverhead National Forest
Custer National Forest
Bighorn Canyon National Recreation Area
Judith Basin
Golden Valley
Musselshell
Petroleum
Fergus
Wheatland
Sweet Grass
Stillwater
Carbon
Yellowstone
Big Horn
Treasure
Rosebud
Powder River
Carter
Fallon
Prairie
Wibaux
Dawson
Richland
Roosevelt
Sheridan
Daniels
Valley
Phillips
Blaine
Hill
Liberty
Toole
Pondera
Teton
Chouteau
Cascade
Lewis and Clark
Jefferson
Broadwater
Meagher
Golden Valley
Musselshell
Petroleum
Fergus
Judith Basin
Wheatland
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Yellowstone
Big Horn
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Fallon
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Wibaux
Dawson
Richland
Roosevelt
Sheridan
Daniels
Valley
Phillips
Blaine
Hill
Liberty
Toole
Pondera
Teton
Chouteau
Cascade
Lewis and Clark
Jefferson
Broadwater
Meagher

I. GENERAL DESCRIPTION OF SWEET GRASS COUNTY

Sweet Grass County encompasses 1,181,440 acres of private, state and federal lands in the upper Yellowstone River Valley. (MYAPO 1977) (See Map #1) The Yellowstone River flows east across the middle of the county. Partially completed Interstate 90 and the Burlington Northern Railroad follow the river. Big Timber, the county seat, is 35 miles east of Livingston, 80 miles west of Billings, and 44 miles south of Harlowton. State Highway 298 follows the Boulder River south from Big Timber through McLeod. (See Map #2) Table 1 shows the details of land ownership in the county.

TABLE 1: LAND OWNERSHIP IN SWEET GRASS COUNTY (MYAPO 1977)

Land Ownership	Acres	Percentage of Total
Private and Municipal	840,410	71.1
State of Montana	49,280	4.2
National Forest	276,250	23.4
Bureau of Land Management	14,960	1.3
Small Water Surface Areas	540	0.1
TOTAL	1,181,440	100.0

NOTE: See Also Map #4 in the Back Cover Jacket

Big Timber, the population center of Sweet Grass County, serves as the county seat, but includes the small rural communities of Melville, Greycliff, and McLeod. Although the population density for the entire county is 1.0 person per square mile, the density for the rural areas (excluding Big Timber) is only 0.4 persons per square mile.

TABLE 2: SWEET GRASS COUNTY POPULATION IN 1975

Big Timber	1,750
County Rural	1,150
TOTAL COUNTY	2,900

Elevation and topography in the county, range from peaks above timberline reaching more than 11,000 feet in the Crazy and Beartooth Mountains down across the rolling pine hills and grasslands to the Yellowstone River at 3,800 feet. (See Map #3--Back Cover Jacket)

There is a corresponding range in average annual precipitation. Sixty inches of precipitation, mostly in the form of snow, is normal in the high country; 14 inches is average at the lower elevations.

The vegetation varies with average precipitation. The higher mountain slopes produce some sub-alpine fir, whitebark pine, spruce and considerable lodgepole pine and Douglasfir. The lower mountain slopes, and the ridges and coulees in the northeastern part of the county, are forested with a ponderosa pine overstory and juniper understory. A narrow stringer of cottonwood follows the Yellowstone River. Approximately 12 percent of the private and state land area is forested. The remaining portion of the county is non-forested range and cropland.

Agriculture is the base of Sweet Grass County's economy. Livestock hay and grains are the main products. Mining, tourism, and dude ranching also play significant roles in the local economy. Forest products have had a fairly small, but relatively constant effect. The B and J Sawmill at Reed Point has done most of its logging in Sweet Grass County. Land use in the county is summarized in Table 3 and shown geographically on Map #5--Back Cover Jacket.

TABLE 3: USE OF PRIVATE AND STATE LANDS
IN SWEET GRASS COUNTY (MYAPO 1977)

Land Use	Acres	Percentage of Total
Range	640,970	73.3
Improved Pasture	41,899	4.8
Cropland	84,507	9.7
Forest	103,994	11.9
Other	2,860	0.3
TOTAL	874,230	100.0

(See Map #5--Back Cover Jacket)

II. FIRE HISTORY AND WEATHER PATTERNS

A. FIRE HISTORY:

It is important to recognize that the fire history data obtained from local sources may not be a complete picture of the county-wide situation. It is possible that many small fires are controlled by rural residents and are never reported each year. Also the data in Table 4 does not include any large fires. For example, the following large fires are documented in local records.

1. In the summer of 1963, lightning started a fire north of the Yellowstone River on the east edge of the county. On its main run, this fire spread one mile in four minutes, and burned 4,000 acres before it was controlled.

2. In October of 1964, a fire was ignited about 7 miles west of Big Timber near U.S. Highway 10 and burned southeasterly from the Yellowstone River drainage into the Boulder River drainage. It burned 1,300 acres and threatened the Big Timber airport and the city of Big Timber. A shift in the wind direction averted a disaster.

3. In August of 1966, a fire was started by grain harvesting operations just north of the Yellowstone River between Grey Cliff and Reedpoint. This fire burned 600 acres of forest and rangeland.

4. In July of 1968, a lightning caused fire burned 300 acres of forest and rangeland in the same general area as the 1966 fire.

5. In August of 1973, a lightning caused fire burned 200 acres of forest and rangeland on the divide between Bridger Creek and Lower Deer Creek. Another lightning caused fire burned 50 acres of forest and rangeland near West Bridger Creek.

6. In July of 1974, a man-caused fire (post peeler operation) burned 250 acres of forest land in the eastern foothills of the Crazy Mountains.

The fire history information reveals that railroads and debris burners are the most common ignitors of man-caused fires. Fire occurrence in these categories is fairly well confined to public travel corridors: roads, highways, and, of course, railroads.

Lightning-caused fires follow no particular pattern in the county. They seem to occur randomly in the higher elevations and hilly forested areas.

TABLE 4: FIRE HISTORY OF SWEET GRASS COUNTY, 1975-1977 (BTFD 1977)

Average Number of fires per year	33
Average Fire Size	4 acres
Average Size of Lightning-Caused Fires	1/3 acre
Months of Most Active Lightning Activity	April through August
Average Number of Man-Caused Fires Per Year	30
Average Size of Man-Caused Fires	4 Acres
Three Top Man-Caused Ignitors	
	(1) Railroad: 15 fires per year, 4.5 acres per fire
	(2) Debris Burning: 5 fires per year, 1.0 acres per fire
	(3) Smoker: 4 fires per year, 0.5 acres per fire
Most Active Months of Man-Caused Fires	Feb., March, April
Length of Fire Season	All Year
Average Area Burned Each Year	132 Acres

B. WEATHER PATTERNS

Lightning storms that ignite fires in Sweet Grass County generally move in from the southwest. They follow the Yellowstone River downstream, crossing the north face of the Beartooth Mountains and continuing across the Greycliff-Reed Point area. (See Map #3 in Back Cover Jacket)

Lightning strikes from these passing storms start fires in the ponderosa pine-juniper hills on both sides of the river east of Big Timber.

The Crazy Mountains often divert storms occurring north of the Yellowstone River. It is common for these storms to circle around the south side of the Crazy Mountains and then travel northeasterly across the Melville area toward the Musselshell River.

Storms occurring in the spring usually last one to two days and generate little lightning. Early summer storms in May and June generally last three days to a week and are accompanied by soaking rains. Mid-summer storms in July and August are normally of short duration. There may be two or three isolated high intensity thunder storms each day during this period with hot cloud-to-ground lightning, high wind gusts, hail, and isolated rain showers. There are the storms that cause most of the lightning fires. Fortunately, the rains that normally accompany these storms reduce fire ignitions to a point that the county has been able to suppress those fires that do occur.

Equinoctial storms of early September usually last a week and are followed by a dry Indian summer which lasts until the first October snowfall. Mountain snow accumulation begins in late November with the advent of winter snow storms.

Brisk often strong, west to southwest "chinook" winds occur at all seasons. Wind speeds exceed fifty miles per hour several times a season with the maximum flows occurring in the winter and early spring. Winter weather is not as severe as generally assumed; in fact, in the last thirty years an average of only fifteen days a winter have had minimums as cold as 0^{0}F (Table 5). January has averaged 26.7^{0}F for the same thirty years--one of the warmer mid-winter averages in the northern Rocky Mountain area. In fact, Big Timber has the warmest winters of all Montana points for which adequate records are maintained (USDA 1935-1964). During the winter, the combination of warm temperatures and strong winds periodically melts the snow at the lower elevations, exposing dry vegetation. Consequently, a year-long fire season is normal for the Big Timber Volunteer Fire Department.

TABLE 5: WEATHER DATA, BIG TIMBER, MONTANA
THIRTY YEAR AVERAGES, 1935-1964 (USDA 1969)

Month	Average Temperature (^{o}F)	Average Precipitation (Inches)	Number of Days 90^{o} and Above
January	26.7	0.52	0
February	30.2	0.50	0
March	35.3	0.96	0
April	45.6	1.50	0
May	54.7	2.78	0.5
June	61.6	2.59	2
July	70.3	0.98	13
August	68.6	1.00	11
September	59.5	1.50	2
October	50.3	1.01	0
November	37.6	0.73	0
December	31.9	0.50	0
YEAR	47.7	14.57	28

III. CURRENT FIRE HAZARDS AND RISKS AND VALUES AT RISK

A. FIRE HAZARDS

A fire hazard is a fuel situation. Hazards, or fuels, are grouped according to kind, amount, condition, and location in relationship to threat of ignition, and suppression difficulty. The basic fuel categories are shown on Table 8, page 18, and Map #5--Back Cover Jacket.

1. Coniferous Forest Fire Hazards

There are two categories of coniferous forest to consider in the Sweet Grass County area of fire protection responsibility: (1) The higher elevation Douglasfir forests, and (2) the lower elevation ponderosa pine forests.

The higher elevation Douglasfir forests are a major fire hazard if severe dry weather conditions exist. However, the temperature and precipitation conditions common on these sites limit the fire season to about three months. During this three-month season, the threat of ignition is moderate to high and the suppression difficulty high.

Photo 2: Fire Hazard--Douglasfir Forest and Logging Slash

Slash resulting from forest harvest operations is a special fire hazard to consider in the coniferous forest. The Montana Fire Hazard Reduction Law provides for a means of slash disposal on private lands. However, in any given operation, there is an interim period, during and after harvest operations, and before slash disposal, when the slash presents a major fire hazard.

The average timber harvest on state and private lands in Sweet Grass County has been 400 thousand board feet of ponderosa pine and Douglasfir sawlogs, and several hundred lodgepole pine posts annually. This annual cut produces about 800 tons of slash each year on the county protection area. Recent activity by the timber industry in the Livingston area indicates a probably increase in private land logging, slash production, and the associated fire hazard.

TABLE 6: BOARD FEET OF TIMBER CUT FROM PRIVATE LANDS IN SWEET GRASS COUNTY, 1971-1977

Year	Board Feet Cut
1971	10,000
1972	27,760
1973	319,470
1974	272,107
1975	120,030
1976	134,861
1977	627,610

Photo 3: Fire Hazard--Ponderosa Pine and Juniper Forest

The lower elevation ponderosa pine forests are a major fire hazard under normally dry weather conditions. There drier, hotter sites are subject to fire starts for a considerably longer time than the higher elevation sites. Both the threat of ignition and the suppression difficulty are moderate to high in this fuel category.

Forest insect and disease damage is another special fire hazard in the coniferous forest. The Douglasfir stands have been attacked in previous epidemics by the spruce budworm, but enough time has passed that those dead stands do not now pose a significant fire hazard. However, budworm infestations in both the Crazy Mountains and Beartooth foothills were detected in 1976. (See Map #6) This situation should be closely monitored from a fire control standpoint. If significant amounts of timber are killed from the insect attacks, large amounts of dry fuel and snags will be produced. The result could be an increase in lightning fire ignitions and will increase fire spread in these fuels.

MAP #6
WESTERN SPRUCE
BUDWORM INFESTATIONS

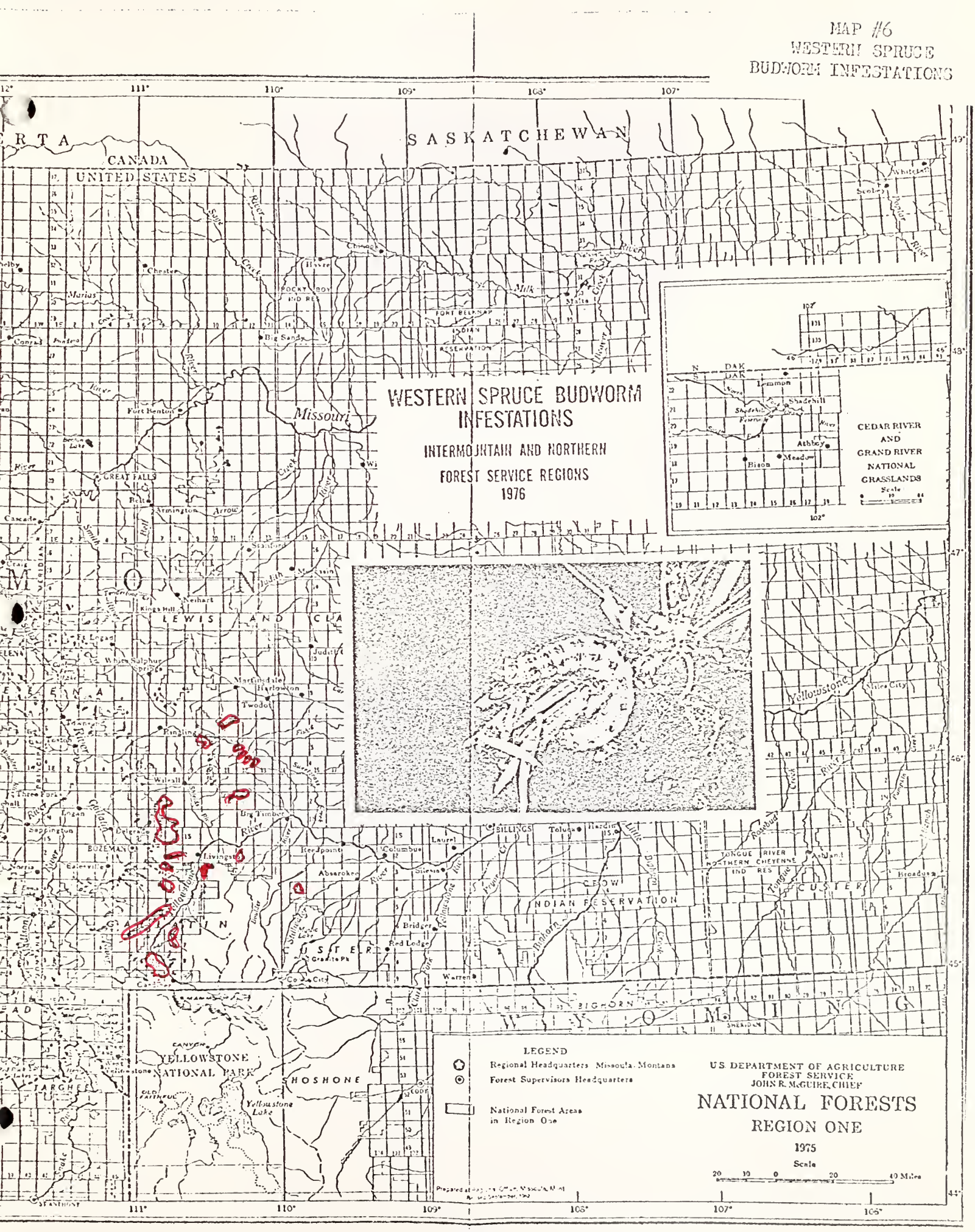

Photo 4: Fire Hazard--Rangeland

2. Rangeland Fire Hazards

Rangeland fuels are predominantly grass and sagebrush. These light fuels are very responsive to changes in moisture, temperature and wind. Under dry conditions, this fuel type can present a fire hazard most of the year. Significant fluctuations in burning conditions can occur daily even in the winter months. The nature of these fuels offers the potential for large, fast moving fires.

Photo 5: Fire Hazard--River Bottom

3. River Bottom Fire Hazards

The river bottom fuel type is mainly cottonwood trees with a brushy understory. These fuels normally are not highly combustible, and fires usually exhibit a slow rate of speed.

Photo 6: Fire Hazard--Cropland

4. Cropland Fire Hazards

Certain dryland crops, such as wheat, present a high fire hazard on a limited seasonal basis. A fire ignited in a ripe wheat field is usually very fast moving and difficult to control. Irrigated cropland, of course, is not a fire hazard.

TABLE 7: GENERAL FIRE HAZARD RATINGS OF SWEET GRASS COUNTY

Hazard Category	Value at Risk	Risk of Ignition	Difficulty of Suppression	Length of Season
Coniferous Forest	Low-Med.	Moderate	High	Short-Med.
Rangeland	Med.-High	Mod.-High	Low	Med.-Long
River Bottom	Low	Moderate	Moderate	Medium
Dryland Crops	High	Mod.-High	Mod.-High	Short

(Also, See Map #5--Back Cover Jacket)

B. FIRE RISKS

A fire risk is an ignitor; something that starts a fire.

Fire records clearly show that man-caused fires are more of a problem than lightning caused fires in the county protection area. Causative agents, in order of significance are: railroads, debris burning, smoker, machinery, power lines, recreationists.

Records do not indicate a particular pattern or concentration of lightning caused fires. Lightning fires seem to occur randomly in the higher elevations and, due to accompanying rains, normally do not present a major problem.

C. VALUES AT RISK FROM FIRE

1. Structural Values at Risk

Rural population distribution figures indicate that structure densities in the county are very low, with the exception of the communities of Big Timber, McLeod, Greycliff, and Melville. Rural subdivision activity has increased in recent years, but is not presently a major fire protection concern except in a few specific locations as shown on Map #5--Back Cover Jacket. In any case, individual groups of farm and ranch buildings can be threatened by large, fast moving wildfires. These structures represent a primary value at risk, and protection of this property is a high priority item.

Photo 7: Value at Risk--Rural Structures

Photo 8: Value at Risk--Livestock and Grazing

2. Livestock and Grazing Values at Risk

Agriculture, particularly livestock production, is the base of Sweet Grass County's economy. While livestock grazing tends to reduce the amount of fire fuel, the stock and associated forage needed represents a significant value at risk. With the strong winds that are so common in this area, the threat of a major range fire is a constant consideration. Protection of the livestock industry is a high priority item.

While destruction of a pasture by fire is not a permanent loss, it can create a serious economic problem for the landowner. He could be forced to lease another pasture, buy feed, or make an unplanned sale of livestock that would otherwise not be necessary. Loss of haystacks to range fires can be especially damaging financially.

Photo 9: Value at Risk--Cropland

3. Cropland Values at Risk

Most of the cultivated croplands in Sweet Grass County are scattered throughout the rangeland north of the Yellowstone River. The relatively high value of this resource during the summer fire season makes it high in protection priority. Probably the greatest threat would be in conjunction with a large, fast moving range fire, or during harvest operations when mechanized equipment is operated in cured and dry grain fields. Irrigated cropland sustaining green crops through the fire season would act as a barrier to fire spread.

Photo 10: Value at Risk--Forest Products

4. Forest Products Values at Risk

Logging and other forest harvest operations presently generate about $10,000 annually to the state and to private landowners in the county protection area. Increasing lumber prices would indicate an increasing forest land value at risk from fire.

Photo 11: Value at Risk--Watershed

5. Watershed Values at Risk

Sweet Grass County is blessed with an abundance of high quality water and this resource deserves protection. Fire damage to watersheds would likely be most severe from a large timber fire in the mountains. Rangeland fires would probably not seriously effect watersheds unless repeated burns occur in the same area, or revegetation does not take place and severe erosion is the result.

Photo 12: Value at Risk--Industrial

6. Industrial Values at Risk

Industry represents a small economic sector in Sweet Grass County. There are, however, industrial values at risk to consider.

Electrical power and telephone lines are concentrated mostly in the populated areas along the Yellowstone River corridor. Loss of these services to fire damage would at least create an inconvenience, and a repair cost, and could cause a serious safety and welfare problem.

The main line of the Burlington Northern Railroad follows the Yellowstone River across the county. Signal circuitry, and associated equipment, is vulnerable to fire damage. Ironically, the biggest fire risk to this equipment comes from the railroad equipment itself, which is also the major man-caused fire risk in the county.

Continuing development of minerals, oil and natural gas represents an increasing value at risk. Underground natural gas lines traverse the county, but they are not normally threatened by wildfire.

7. Recreational, Aesthetic and Wildlife Values at Risk

Outdoor recreation in Sweet Grass County is primarily geared to undeveloped, dispersed use activities such as hunting, fishing and hiking. National forest lands are a primary attraction to recreationists. While the Forest Service provides direct fire protection to these lands, the users do, of course, travel across county protected lands on their way to and from the national forest.

Campgrounds, highway rests stops, fishing access sites and designated points of interest are other examples of public attractions that represent values at risk. These facilities are shown on Map #4 (Back Cover Jacket).

The private sector recreational value should also be considered. Probably most rural residents make some sort of recreational use of their lands, and there is some income derived from dude ranching and big game hunting.

Obviously, the scenic and wildlife resources are components of outdoor recreation attractions, and represent important values at risk. A large, severe forest fire could have a long term adverse effect on the recreation, scenic and wildlife resources.

IV. FIREFIGHTING CAPABILITY OF SWEET GRASS COUNTY

A. ORGANIZATION

1. Structural

The responsibility for structure fire protection in Sweet Grass County rests entirely with the Big Timber Volunteer Fire Department.

2. Wildland

(a) Privately Owned Lands (840,410 Acres)

It is the responsibility of Sweet Grass County, through the Big Timber Volunteer Fire Department, to provide wildland fire protection to 829,784 acres of privately owned lands in the county. Sweet Grass County, through this document, is requesting to enter into a cooperative agreement with the State of Montana to better meet its fire protection responsibilities.

A program is available to owners of private land if that land lies within national forest boundaries whereby they can enter into a fire protection affidavit agreement with the State of Montana. They are assessed for this service. The state provides fire protection through the U.S. Forest Service on 10,626 acres of private land in Sweet Grass County under this program.

(b) State Owned Lands (49,280 Acres)

The State delegates the responsibility for wildland fire protection of all but its forest lands to the State lessees. Many of these lands are in turn protected by the County. Classified state forest lands inside U.S. Forest Service boundaries receive protection under a cooperative agreement between the State and U.S. Forest Service.

A cooperative fire control agreement between Sweet Grass County and the State of Montana would also aid the lessees of state owned land in the county by improving the level of fire protection on those lands.

(c) Federal (291,210 Acres)

Fire protection of federal lands in the county is the responsibility of either the U.S. Forest Service or the Bureau of Land Management. (See Map #3 and #4--Back Cover Jacket)

Table 7, page 11, shows the area of land for which each protection agency is responsible.

TABLE 8: WILDLAND FIRE PROTECTION RESPONSIBILITY IN SWEET GRASS COUNTY

	829,784	Private and Municipal Land
Sweet Grass County	49,280	State Land
	879,064	TOTAL COUNTY PROTECTION
State of Montana	10,626	Affidavit Protection on Private Land Within National Forest
U.S. Forest Service	276,250	
Bureau of Land Management	14,960	
TOTAL	1,180,900 Acres	

B. TRAINING

The Big Timber Volunteer Fire Department has a commendable fire training program. Members meet twice a month for training purposes. The Big Timber Ranger District has been assisting with basic wildland fire training. Members occasionally set a practice fire to test equipment and to review suppression techniques. Equipment familiarization and use is an on-going job. The Fire Chief has even arranged for training on air water drops using small planes designed for agricultural use.

Structure fire training programs are available through the Fire Service Academy and these programs are used by the Department. In addition, wildland fire training assistance would be available through the Forestry Division of the Department of Natural Resources and Conservation as part of the cooperative fire control agreement.

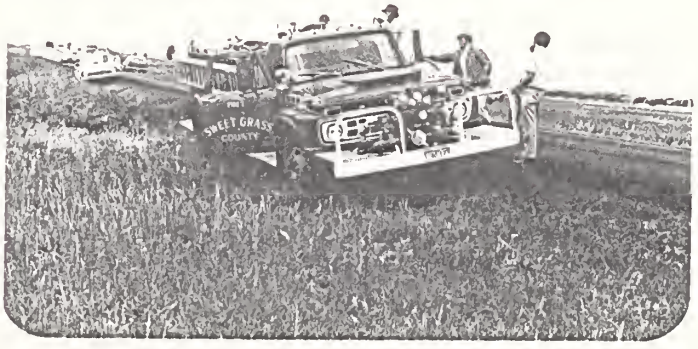

Photo 13: Example of Big Timber Volunteer Fire Department Equipment

C. FIRE PREVENTION

The following fire prevention measures are in effect in Sweet Grass County:

1. Educational Measures

The Big Timber Volunteer Fire Department daily receives wildland fire danger reports from the Big Timber Ranger District during the summer fire season. When severe conditions develop, news releases are made to alert the public. Local area schools participate in the Keep Montana Green poster contest.

2. Law Enforcement

State law 28-603 authorizes the county governing body to issue burning permits and this authority is exercised by Sweet Grass County. The Big Timber Fire Department is in charge of permit administration.

3. Fuels Engineering

An effort has been made by the Big Timber Volunteer Fire Department to cooperate with the Burlington Northern Railroad in controlled burning of right-of-ways. The proposal has not been well received by the railroad at this time.

D. DETECTION

The primary means of fire detection is observation by local residents. These people are typically very fire conscious, and promptly report suspicious smokes to the Big Timber Volunteer Fire Department or to the Sheriff's office.

Aerial detection, however, is also an important part of the county detection system, and private aircraft pilots are cooperative about reporting fires. Fires observed in the county protection area by the Forest Service patrol flights are also reported to the Sheriff, or to the Big Timber Volunteer Fire Department.

E. REPORTING AND COMMUNICATIONS

The Big Timber Volunteer Fire Department has an excellent communications system in operation. A telephone network linking department members and officers is manned continuously by the Sheriff's office. The telephone is the primary link with the outlying rural area. A limited system of pagers is in use, with plans to expand that capability. All department vehicles are equipped with citizens band radios and with the local law enforcement network. A Forest Service portable radio is available on a loan basis for use on National Forest related fires.

F. PRESUPPRESSION

1. Transportation Systems

Primary road systems in the county are shown on Maps 3, 4, and 5 (Back Cover Jacket). Most of the county protection area is readily accessible by four wheel drive equipment.

There is a 4,650 foot long runway at the Big Timber airport and several ranches have small, private airstrips.

2. Equipment Available

(a) Big Timber Volunteer Fire Department Equipment:

1 - 25 gallon tanker
1 - 1000 gallon tanker
1 - 750 gallon tanker
1 - 500 gallon tanker
1 - 250 gallon tanker
1 - 350 gallon minute filler pump
1 - 150 gallon minute filler pump
1 - jeep
1 - 25 man tool unit on loan from the U.S. Forest Service

(b) Sweet Grass County Road Department Equipment:

1 - dozer (HD-11)
4 - graders
1 - transport truck--Lowboy

(c) Private Equipment

1 - spray plane (180 gallon capacity aircraft)
A variety of privately owned heavy equipment, farm machinery and vehicles could be mustered locally, if needed.

3. Manpower

(a) Big Timber Fire Department

1 - fulltime paid chief
40 - volunteers

(b) Sweet Grass County Road Department

6 - heavy equipment operators

(c) Private

Farm and ranch crews are available locally, if needed

G. SUPPRESSION

1. Dispatching and Initial Attack

Under the present system, all fire reports in Sweet Grass County are made to the appropriate protection agency in Big Timber; either the Big Timber Volunteer Fire Department or the U.S. Forest Service. Initial attack dispatches by the Big Timber Volunteer Fire Department in the county protection area are based on information provided in the report, such as: location of the fire, fuel in that area, topography features and the fire's behavior. Weather conditions and other fire activity in the county will also influence the initial dispatch of men and equipment.

2. Coordination and Support

Upon arrival at the fire, the initial attack crew reports the situation to the Big Timber Volunteer Fire Department. If support is needed, it normally comes from volunteers in Big Timber. If additional support is needed, it is obtained from local residents or adjacent counties. These actions are coordinated by the Big Timber fire chief, in cooperation with the Sweet Grass County Sheriff's office.

3. Cooperative Agreements and Mutual Aid Assistance

(a) Adjacent Counties

The Big Timber Volunteer Fire Department has a written mutual aid agreement with Park County to the west and an informal agreement with Wheatland County to the north.

(b) U.S. Forest Service

The Big Timber Volunteer Fire Department has a cooperative agreement with the Big Timber Ranger District whereby the fire department will assist, upon U.S. Forest Service request, in the suppression of fires on national forest protection.

4. Disaster Planning

Fire control and disaster planning are tightly linked in this county. Dennis Beer, Big Timber Volunteer Fire Department Chief, is also the Emergency and Disaster Services Director for Sweet Grass County. The fire department is very active in the emergency medical services program and in the sheriff's posse.

H. FUNDING

1. County Funds ($6,800-$9,800)

The Big Timber Volunteer Fire Department presently has an annual budget of $6,800 for rural fire protection. There is an additional $3,000 emergency fund for fire and other emergencies.

2. Rural Fire District and Volunteer Fire Company Funds ($7,000)

A county-wide rural fire district has recently been formed. Assessments have not yet been initiated, but will generate about the same revenue as voluntary contributions in the past. This has been about $7,000 annually.

3. Volunteer Efforts

It is difficult to assess the economic value of forty volunteer firemen. The donated time in training, meeting attendance, and fire control efforts alone is worth several thousand dollars annually.

V. PROTECTION NEEDS

A. ORGANIZATION AND PLANNING

The County working with the state should:

1. Enter into a cooperative fire control agreement with the State of Montana. This action will enable Sweet Grass County to supplement, and improve, its fire protection of state and private natural resources in the county's area of responsibility.

2. Form a county rural fire council. This body would serve in an advisory capacity to assist in identifying and solving fire problems throughout the county.

3. Form initial attack satellite groups at Melville and McLeod. These would be first call units of the Big Timber Fire Department and their formation will significantly reduce response times.

4. Develop a state-county annual operating plan. This would serve to identify manpower and equipment needs and proposed locations, areas of responsibility, communications procedures and the necessary organizational structure.

B. TRAINING

The County working with the state should:

1. Provide basic wildland fire training to volunteers as outlined in the annual operating plan.

2. Provide equipment operations training to volunteers; especially to users of state-owned equipment.

3. Provide specific and advanced wildland fire training to the County Firewarden and individual members of the Big Timber Volunteer Fire Department.

4. Identify unique training needs, such as suppressing fires which are ignited in train derailments. The council should assist with filling those needs.

C. FIRE PREVENTION

The County working with the state should:

1. Coordinate specific prevention efforts as outlined in the annual operating plan. There is an obvious need to work with the Burlington Northern Railroad on such projects as fire guard plowing and burning of right-of-ways.

2. Continue to develop public awareness of fire danger through news media exposure.

3. Promote local participation in the Keep Montana Green poster contest.

4. Coordinate county fire closure requests as needed.

D. DETECTION, REPORTING AND COMMUNICATIONS

The County working with the state should:

1. Increase the number of radio pagers owned by the Big Timber Volunteer Fire Department, to improve the capability of notifying and dispatching volunteers.

2. Increase the number of mobile radios so that all firefighting vehicles are radio equipped.

E. PRESUPPRESSION

1. Equipment

An analysis of the available information indicates that the State of Montana should provide to Sweet Grass County the following equipment:

(a) 4 - 5 man tool units

(b) 2 - Initial attack tankers. These tankers should be four wheel drive trucks complete with 200 gallon tanks, fire pumps and tool complements.

(c) 2 - 1000 gallon tanks and pumps with complete tool complements to outfit two Civil Defense six wheel drive trucks furnished by the County.

Photo 14: Example of State-owned Equipment Needed

2. Manpower

The number of available volunteer firemen should initially be increased by twenty-five at Melville and at other locations as needed when additional equipment is available.

F. SUPPRESSION

1. Dispatching and Initial Attack

Development of an initial attack satellite group at Melville and placing two additional tankers at such outlying areas as McLeod and Gray Cliff will improve county-wide dispatching and initial attack efficiency. Improving communications by adding radio pagers and vehicle radios will cut down on initial attack response times.

2. Cooperative Agreements

(a) State of Montana

A cooperative fire control agreement between Sweet Grass County and the State of Montana will enable the county to receive assistance in organization and planning, equipment procurement, wildfire control training and fire prevention efforts. In addition, the county will be afforded state support, if needed, in a fire emergency situation. The state will benefit by receiving protection on the 49,280 acres of state land and the 840,410 acres of private lands in the county.

(b) Park, Wheatland and Golden Valley Counties

A mutual aid fire protection agreement should be entered into between Sweet Grass, Park, Wheatland and Golden Valley counties. This agreement would facilitate cooperation on boundary line fires and would provide for the use of state-owned fire equipment across county lines. Park, Wheatland and Golden Valley Counties already participate in the state-county cooperative fire program.

VI. PROPOSED FISCAL PLAN

The proposed fiscal plan for the state-county cooperative fire program is summarized in Tables 9, 10 and 11.

Detailed and itemized expenditures will be outlined in the annual operating plan. Sweet Grass County expenditures are based on current operating levels and anticipated cost increases. They include volunteer efforts of local fire forces. State expenditures are based on needs that this plan indicates as necessary for the State to cooperate in a fire control program.

TABLE 9: SWEET GRASS COUNTY'S EXPENDITURES IN A COOPERATIVE FIRE CONTROL PROGRAM*

	F.Y. 1980	F.Y. 1981	Continuous
Fire Organization & Planning	$ 2,257	$ 1,930	$ 2,000
Wildland Fire Training	16,060	18,348	18,348
Wildland Fire Suppression	24,900	24,900	24,900
Wildland Fire Equipment	16,500	17,380	18,350
Fire Prevention	1,298	1,325	1,355
Fire Detection & Reporting	186	186	186
TOTAL	$61,201	$64,069	$65,139

TABLE 10: STATE OF MONTANA'S EXPENDITURES IN A COOPERATIVE FIRE CONTROL PROGRAM*

	F.Y. 1980	F.Y. 1981	Continuous
Salaries and Wages	$14,022	$14,583	$15,166
Contracted Services	260	360	360
Supplies and Materials	2,400	3,000	3,000
Communication & Transportation	50	50	50
Utilities	100	100	100
Travel	600	600	600
Repairs & Maintenance	1,200	1,300	400
Capital	19,600	9,600	2,920
TOTAL	$38,238	$29,593	$22,596

TABLE 11: COMBINED STATE AND COUNTY EXPENDITURES*

	F.Y. 1980	F.Y. 1981	Continuous
Sweet Grass County	$61,201	$64,069	$65,139
State of Montana	38,238	29,593	22,596
TOTAL	$99,439	$93,662	$87,735

*These figures would need to be adjusted annually due to increases caused by inflation, etc.

SOURCES OF INFORMATION

Big Timber Fire Department (BTFD 1977), Personal Communication.

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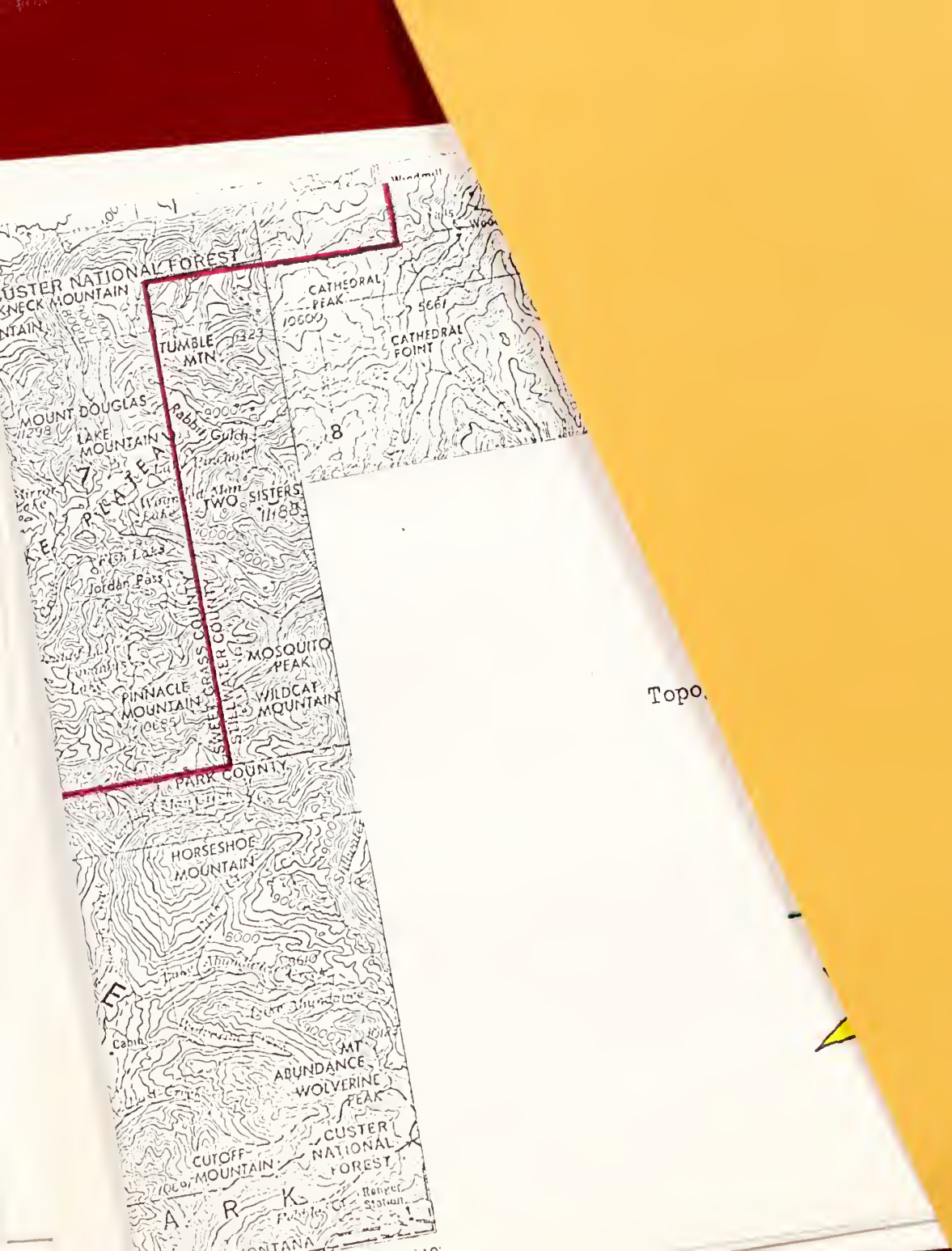
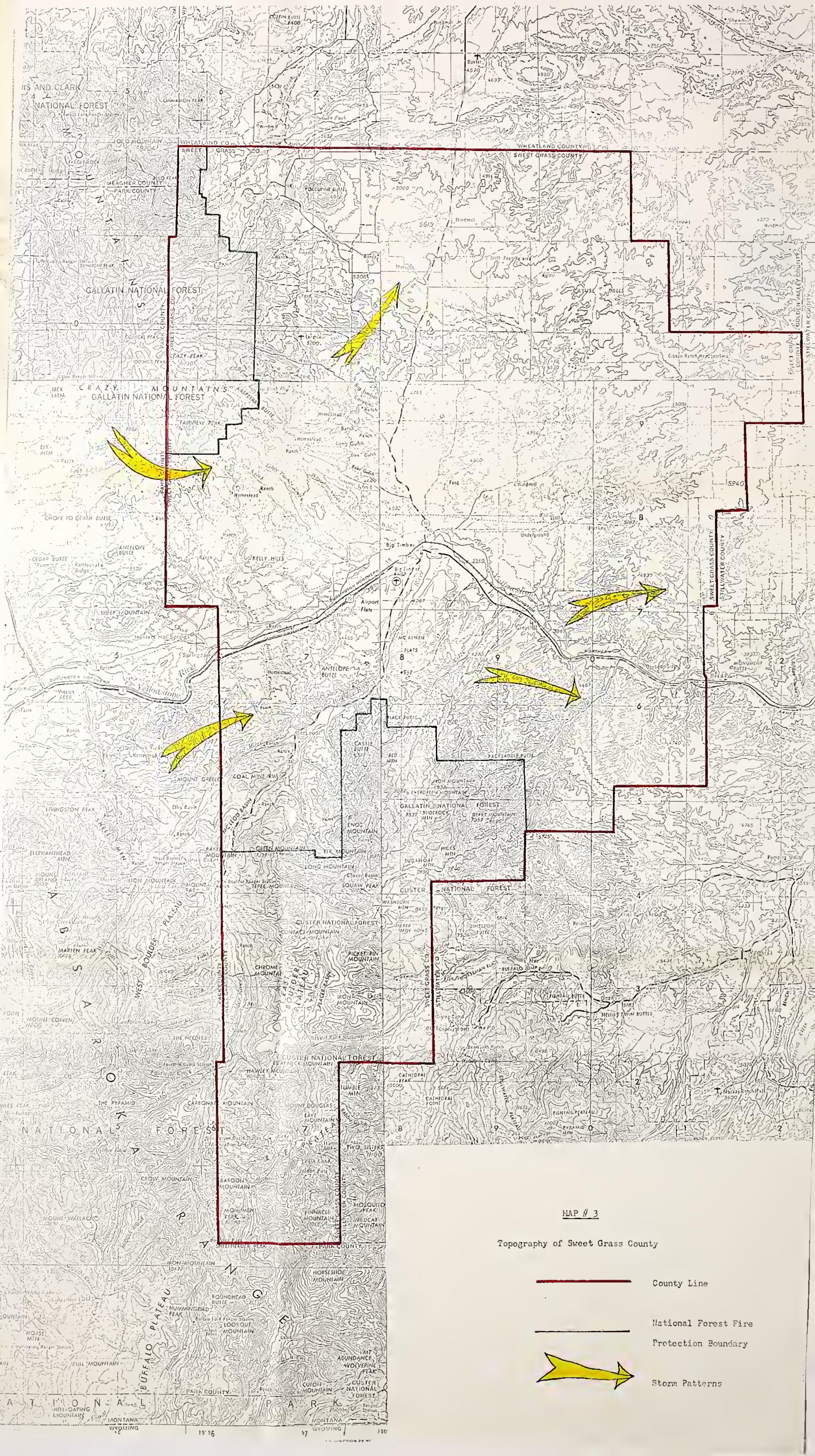
U.S. Department of Agriculture (USDA 1978), Forest Service, "Forestry Research What's New in the West".

U.S. Department of Commerce (USDC 1935-1964), Weather Service, Climatological Summary, Station Big Timber, Montana.


CUSTER NATIONAL FOREST
CATHEDRAL PEAK
10600
5661
CATHEDRAL POINT
TUMBLE MTN
MOUNT DOUGLAS
LAKE MOUNTAIN
Pebble Gulch
TWO SISTERS
Jordan Pass
SWEET GRASS COUNTY
STILLWATER COUNTY
MOSQUITO PEAK
PINNACLE MOUNTAIN
WILDCAT MOUNTAIN
PARK COUNTY
HORSESHOE MOUNTAIN
MT ABUNDANCE
WOLVERINE PEAK
CUSTER NATIONAL FOREST
CUTOFF MOUNTAIN
Ranger Station
7
8

Topo.



MAP # 3

Topography of Sweet Grass County

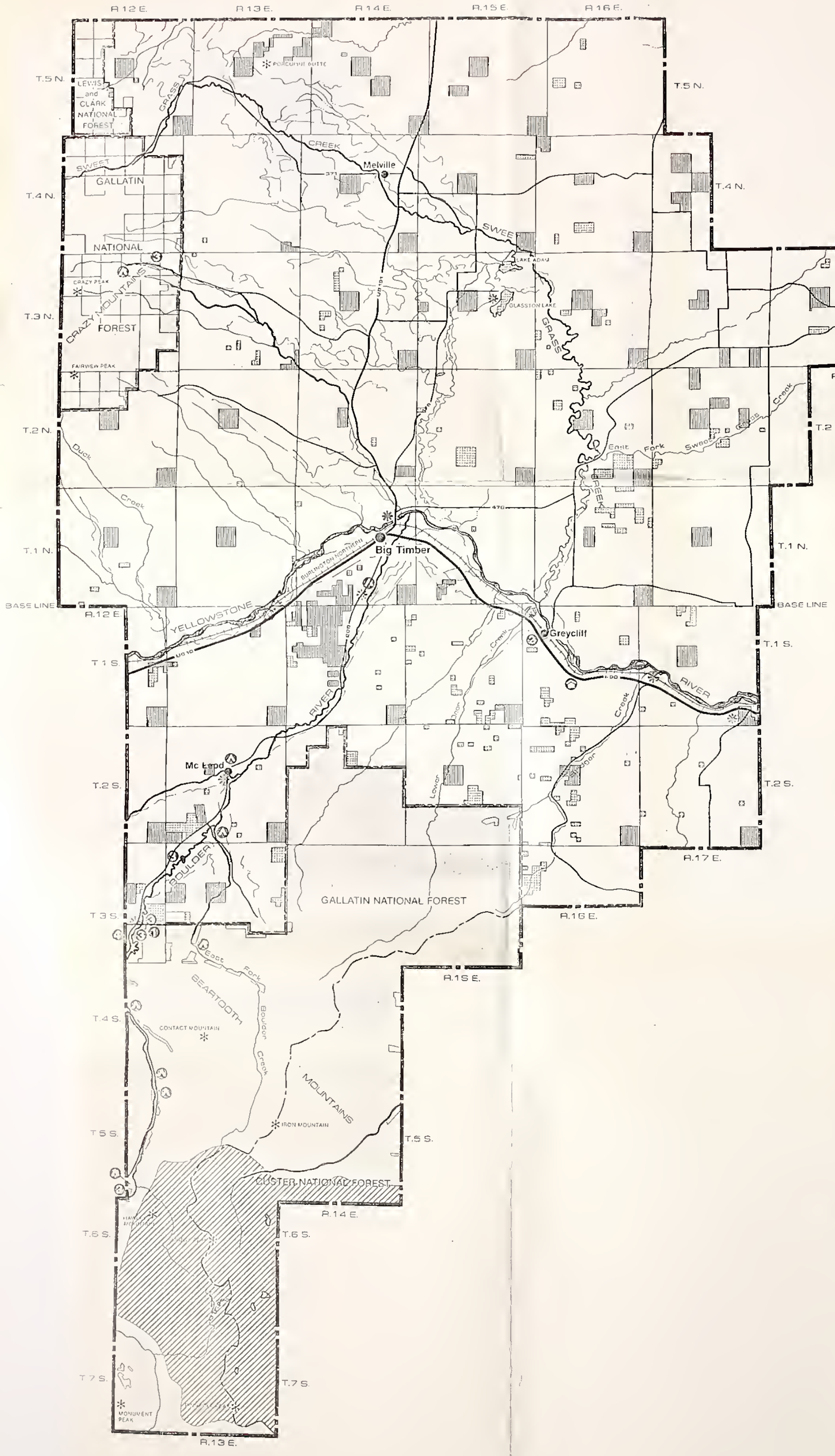
County Line

National Forest Fire Protection Boundary

Storm Patterns

Map # 4

Land Ownership of
Sweet Grass County



COUNTY of SWEET GRASS
Land Use
LAND OWNERSHIP and RECREATION

LAND OWNERSHIP

- U.S. Forest Service
- Bureau of Land Management
- State
- Private

RECREATION

- National Forest
- Wilderness Area (proposed)
- Campgrounds
- Rest Stops
- Fishing Access
- Blue Ribbon Fishing Stream
- Fishing Streams of Statewide Importance

POINTS OF INTEREST

1. Natural Bridge
2. Greycliff Prairie Dog Town
3. Dude Ranch
4. Chief Joseph Monument

Prepared for
MID-YELLOWSTONE AREAWIDE PLANNING ORGANIZATION
Billings, Montana

Graphics by
WIRTH ASSOCIATES, INC.
Billings, Montana

NORTH

0 1 2 4 8 MILES

1:250,000

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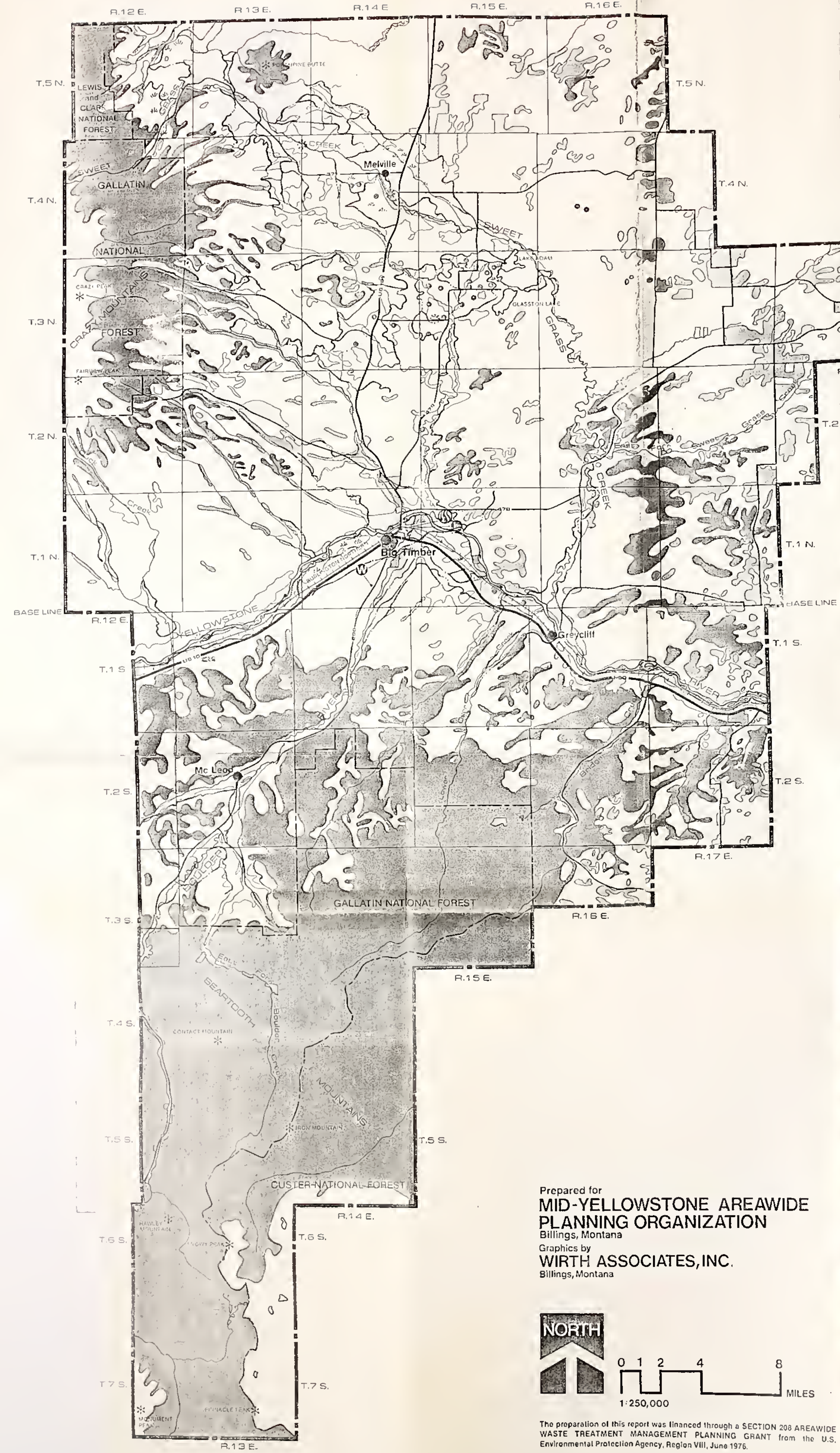
MAP # 5

Land Use of Sweet Grass Co.



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Billings, Montana

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COUNTY of SWEET GRASS Land Use

URBAN, SCATTERED and BUILT-UP AGRICULTURAL, RANGE, FOREST and PROBLEM LANDS

URBAN, SCATTERED and BUILT-UP

- Residential Commercial High Density — 1 OR MORE D.U./ACRE
- Residential Commercial Low Density — 0.5 TO .9 D.U./ACRE
- Industrial Discharge
- Land Fill — ACTIVE UNLESS NOTED OTHERWISE
- Waste Treatment Sewage
- Water Treatment
- Areas of Potential Commercial and Residential Development — INCLUDES: PLATTED SUBDIVISIONS and AREAS WITH CERTIFICATES OF SURVEY

AGRICULTURAL, RANGE, FOREST and PROBLEM AREAS

- Irrigated Lands
- Dry Croplands
- Commercial Feedlots
- Rangeland — GRASSLANDS
- Coniferous Forests
- Deciduous Forests
- Saline Seeps and Soils
- Alkali Flats
- Irrigation Canals
- Marsh Lands